STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

August 13, 1999

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Mr. Emil Klawitter
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Re: Draft Final Long Term Monitoring Plan
Sites 1 &3 and Eastern Plume-Naval Air Station-Brunswick

Dear Mr. Klawitter:

The Department of Environmental Protection (DEP or Department) has reviewed the report entitled Draft Final, Long Term Monitoring Plan, Sites 1 and 3 and Eastern Plume, dated June 1999, prepared by EA Engineering, Science and Technology. Based on that review the Department has the following comments and issues.

General Comments:

1. The new Figure 1-2 is nicely done. However, Figure 1-2 shows the "approximate limits of the Eastern Plume in 1999" while Figure 3-1 shows the "inferred extent of Eastern Plume above MEG/MCL based on Monitoring Event 13 data (November 1998). A significant difference exists between the plume expanse shown on these maps. Figure 1-2 indicates one continuous plume from north to south, while Figure 3-1 shows distinctly disconnected northern and southern lobes. While the Navy may be able to support both versions based on differences in dates of data and VOC detections versus MEG/MCL exceedences, the reader will likely be confused. The separate lobe interpretation historically has been displayed in reports. MEDEP is open-minded as to whether this interpretation is a result of data gaps, or whether the bedrock ridge at MW-308 actually does not allow contamination from a wide and composite source area to merge together downgradient.

   To correct this situation, either the mapping criteria should be changed to produce a single version, or else the legends of both maps be made more explicit and new text added to explain the different interpretative approaches taken. The Department recognizes that added value might be achieved by showing both the limits of VOC detections and the area where MEGs/MCLs are exceeded.

2. Figures 3-1 through 3-3 document well the new revised long-term monitoring program. However, the Department is disappointed that the Navy rejected our suggestion (Comment 42) to include a map figure showing the original monitoring locations. We still feel that it would be beneficial to make available a visual comparison between programs. The reader could then better appreciate an improved coverage due to the addition of new wells. We recognize that Table 1-2 lists the deletions from the original program, but their locations are not shown on any figure in this report. Please reconsider our request.

3. The water level gauging and criteria for the reactivation of extraction wells 6 and 7 in landfills 1 &3 needs to be added to the long term monitoring plan. This also needs to be added to the list of goals in section 1.1.

4. For sediment sampling, perhaps we should be considering methanol preservation of VOC sediment samples. In researching the subject it appears that most VOCs are lost in the sampling procedure and

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even though the given detection limit of methanol preserved samples is higher than unpreserved samples, more of the contaminant(s) is retained in the preserved samples.

Specific Comments:

5. Introduction, Section 1.0, page 1-1, 4th sentence:

"Changes to the LTMP have been made based on a geostatistical evaluation (EA 1998a) and observed trends in chemical concentrations over time."

The Department suggests the above be modified as follows to be more accurate: "Changes to the existing LTMP are based on a number of factors, including:

- a geostatistical assessment that assessed the adequacy of the well network,
- graphs of chemical concentrations measured over time,
- new information regarding plume extent and migration,
- reclassification of monitoring wells into interior, perimeter or sentinel wells,
- changes to remedial pumping locations.

6. Purpose and Scope, Section 1.1, page 1-1, 1st sentence:

"The purpose of this LTMP document is to identify monitoring points where samples will be collected and laboratory analysis that will be conducted to verify the effectiveness of the selected remedial actions."

Please modify as follows. The purpose of this LTMP document is to:

- develop a monitoring program that identifies monitoring points and the media that will be sampled
- identifies type of sampling, and sampling frequency,
- and specifies the laboratory analyses to be implemented.

7. Purpose and Scope, Section 1.1, page 1-2, top paragraph:

"Sampling at Sites 1 and 3 is planned for up to 30 years ..."

As stated in our previous comment letter, the Record of Decision (ROD) for Remedial Action At Sites 1 and 3 (June 1992) Environmental Monitoring (Page 52) reads, " At a minimum, the environmental monitoring program would continue for 30 years.". This is consistent with 40 CFR 264.117 (RCRA) which is an action specific ARAR for sites 1 and 3. RCRA mandates 30 years of monitoring but can be extended, if deemed necessary. Therefore the Navy must change this statement to be consistent with the language in the ROD and meet the RCRA requirement.

8. Purpose and Scope, Section 1.1, page 1-2, 1st para:

The Navy needs to mention here that the annual reports and their reviews by regulators and the RAB also provide a means to discuss and potentially initiate changes to the LTMP. This aspect is discussed in Section 3.1, but should also be said in Section 1.1.

9. Purpose and Scope, Section 1.1, page 1-2, 4th bullet:

"Assess the dispersion and degradation of contamination that has already emanated from the landfill."

While this is correct, the goal must be expanded to include monitoring changes in plume expanse and intensity; similar to the second bullet under Eastern Plume. The reason this change is needed is that landfill contamination is not hydraulically contained, and new contamination could emanate from beneath the landfill in the future regardless if the waste is saturated or not. Both shallow and deep potentiometric contour maps do not show any closed contours in the landfill area, and the slurry wall has a 400-foot opening on the downgradient side.

10. Purpose and Scope, Section 1.1, page 1-2, 7th bullet:

"Monitor the treatment plant effluent"

The theme of this goal must be expanded to include treatment plant influent and well extraction rates (as historically done), and these data used to calculate mass removal of contaminants on an annual basis.

11. Purpose and Scope, Section 1.1, pages 1-2 &1-3:

If analytical results indicated that contaminant levels have not exceeded regulatory standards (State Maximum Exposure Guidelines, [MEG], Federal Maximum Contaminant Levels [MCL], or State Water Quality Criteria) or concentrations pose unacceptable risk over the last four or more consecutive rounds, a reduction of sampling or possible termination of the Long-Term Monitoring Program may be considered.

The Department is unsure what the Navy means by this statement. If concentrations pose an unacceptable risk reduction of sampling or termination would not be considered. But as stated in other versions of long term monitoring plans, the Navy must also consider increasing sampling and expanding the program as necessary. Since the following sentence deals with refining the plan this sentence seem unnecessary. If the Navy feels strongly about keeping it (with corrections) then an equally specific statement is needed dealing with increasing and/or expanding the program is necessary.

12. Purpose and Scope, Section 1.1, page 1-3, top paragraph:

a.) "Refinements to the LTMP may include additions or reductions of sampling points in the long-term monitoring network, changing areas of sampling emphasis, or alterations of laboratory analytical method or field sampling methods."

This statement needs to include that the frequency of sampling may also be changed.

b.) "Refinements to the LTMP will be based on a comparison of sample results to regulatory standards (MEG, MCL, or Surface Water Quality Criteria), and will be considered based on consultation with the Restoration Advisory Board members."

Another criteria that should be given is "*nature of trends of recent contaminant concentrations as compared to their respective historical trends.*

c.) Please check the grammar in the last sentence of the paragraph. The word "of" appears to have been left out and the word "sampling" should be omitted.

13. Geology, Section 1.2.2., page 1-4, 2nd sentence:

"Three major units have been identified in the overburden: sand, transition, and clay (E.C. Jordan 1991)."

DEP recommends that this old verbiage is abandoned, and that the geologic setting is portrayed as it is known today. The aquifer that is the focus of remediation is a second deeper sand unit that lies between the transition and underlying clay. It must be named, although it is also important to point out that this unit joins with the upper sand unit that underlies the Eastern Plume source area.

Also, this section should be expanded to briefly mention the bedrock and clay topography as it relates to the plume, and discuss the high variability in clay thickness within the Eastern Plume area. Please make the appropriate changes.

14. Hydrogeology, Section 1.2.3., page 1-5, 2nd sentence:

"In the overburden, variations in shallow and deep potentiometric flow have been observed."

It is unclear what the Navy means by this statement, as the term "potentiometric flow" is not standard technical language. Potentiometric head or contours indicate groundwater flow directions. The contours do have a degree of variability when contrasting the shallow and deep sand units, or as a result of remedial pumping. Movement of groundwater (flow) in the southern-to-eastern general direction certainly must have varied some due to the strength and distribution of groundwater extractions. Please clarify and be more specific.

Hydrogeology also includes groundwater discharge and its relation to surface water runoff. These appear important to understanding the Eastern Plume behavior, and deserve mention, even though the real nature of the relationship is yet unclear.

15. Hydrogeology, Section 1.2.3., page 1-5:

a. "Shallow ground water generally flows toward Mere Brook and Merriconeag Stream."

As stated in our comments on the annual report: "Within the report area this is universally true, the only exceptions being very close-in to the operating extraction wells where minor areas of backflow locally occur. Therefore the word "generally" should be deleted."

b. The clay name "Presumpscot" is misspelled several times. Please correct.

c. The Navy needs to mention that the deep contaminated sand is confined by Transition Unit silts and clays in areas such as in the general area of the confluence of Mere Brook and Merriconeag Stream.

16. Previous Investigations, Section 1.3.1, page 1-6, top bullet:

After "identified", please insert "*and initiated*".

17. Monitoring Locations Relative to the Eastern Plume, Section 1.4.1, page 1-6, 2nd item:

Upon reconsideration, the Department believes that the definition should be modified slightly to read: "*Wells located within the area of known contamination at the edge of the plume. Ground-water data from these wells would be used to document any change in contaminant concentrations occurring at the plume boundary.*" This will also need to be corrected in Table 1-4.

18. Monitoring Locations Relative to the Eastern Plume, Section 1.4.1, Table 1-4:

According to Figure 3-1 and other recent maps of the Eastern Plume, both MW-1104 and MW-306 should not be designated as" perimeter wells" as they are located on essentially the same flow line.

Clearly MW-306 is more within the plume (higher concentrations) than is MW-1104. Our recommendation is to move MW-306 to the "interior well" category.

19. Sampling Frequency, Section 1.4.3; 3rd sentence:

"Following a review of the ground-water concentrations reported in monitoring Events 1 through 13, sampling frequency was reduced to bi-annual sampling at Sites 1 and 3 and Eastern Plume."

Please note the year that the sampling frequency was reduced to bi-annual.

20. Reports and Data Presentation, Section 1.5, Page 1-10, 1st paragraph:

"These monitoring event reports will summarize the ..."

Please clarify that these are individual monitoring events as opposed to the annual report.

There appears to be a contradiction regarding the response to comments. The text states: "The annual report will include the response letters to comments received on the previous year's annual report and monitoring event reports." However the table indicates that the final annual report will be provided to the regulators one month (proposed) after receiving comments. Why wouldn't the Navy just include all responses to comments in the annual report and monitoring event reports in the final annual report? Please consider the following language: The *final* annual report will include the response letters to comments received on the *draft* annual report and monitoring event reports."

The State would like a review period of 45 days rather than one month.

21. Monitoring Plan, Section 3, page 3-1:

a. A bullet should be added to discuss the monitoring of the water level with the landfills to ensure that the current water level do not rise and saturate the waste.

b. Bullet 1: Delete "...and assess effectiveness of remedial actions." This is better said in bullets 2 and 3 below and is not needed twice.

c. Bullet 3: The language "is being maintained" assumes that full hydraulic control has been realized in the past. The Department has not received adequate evidence that this was achieved. Please reword.

d. Bullet 4: Modify by saying "Evaluate the effectiveness of the landfill cap, slurry wall, and *local aquifer dewatering* by..."

22. Surface water and Sediment Sampling Program, Section 3.1.1.2., page 3-2, 1st para:

It is more important that Figure 3-2 show the Eastern Plume boundaries than Figure 3-1. Please add the pale yellow areas to Figure 3-2, as done for Figure 3-1.

23. Surface water and Sediment Sampling Program, Section 3.1.1.2., page 3-2, 3rd para:

Sediment stations SED-17, SED-18, and SED-19 are not shown on Figure 3-2, as stated. These will need to be determined prior finalizing the LTMP

24. Ground-Water Sampling Program, Section 3.1.2.1, page 3-3, last sentence:

"Optional field parameters, including Eh and dissolved oxygen, may also be included."

Per our comment for the 1998 Annual Report review, DEP would like to see the Navy convert these parameters from optional to mandatory. In particular, DO will be necessary to collect to assess natural attenuation potentials. This should also be corrected in section 3.1.1.3.

25. Stream Sediment Sampling Program, Section 3.1.2.3, page 3-4:

"One stream sediment sampling location (SED-11) within the Eastern Plume on Mere Brook is included in the Long-Term Monitoring Program and identified on Figure 3-2."

One sampling location will not be adequate to monitor for plume seepage into the streams (if that is occurring), but might be adequate to monitor TAL elements that may be migrating within the stream channel from upstream sources. The Department may want to add additional locations to the Eastern Plume sediment program; the vapor concentration results from the currently deployed diffusion samplers along Mere Brook and Merriconeag Stream may influence our stance on this issue. Depending on these results, VOC analysis may be required for sediment samples.

26. Ground-Water Extraction and Treatment System Sampling Program, Section 3.1.2.4, 1st para:

"Six samples will be collected from the active extraction well (EW-1 through EW-5 and EW-2A) (Table 3-2)."

Currently, EW-3 is down and the Navy has said it will not be repaired. In that other currently used extraction wells have experienced problems, the above statement should be rewritten. We suggest: *"Ground-water samples will be collected at the well head from all active extraction wells (see Table 3-2 for currently active wells)."*

27. Ground-Water Extraction and Treatment System Sampling Program, Section 3.1.2.4, 2nd para:

As previously suggested, it would be prudent to test for iron and manganese to track if these elements may accumulate and pose operational problems to well screens and pumps. TAL elements are not included in the analyses for the Eastern Plume monitoring wells, and therefore, testing the extraction wells for iron and manganese may also provide useful data to help assess natural attenuation. A field Hach kit would be appropriate for the intended purpose, and would require only several minutes more per well sampled.

28. Surface Water and Sediment Sampling Program, Section 3.3.2, page 3-5:

Procedures provided in Appendix A do not specify what depth in the water column surface water samples should be collected. Based on observing sample collection at Merriconeag Stream, the Department is concerned that past sampling is biased toward non-detects because water in the upper interval of the water column was sampled. This scenario is possible due to the non-turbulent, quiet flow in the channels, where the distribution of volatile compounds in the water column likely is not uniform. If the Eastern Plume is discharging to the streams (or streambeds), the highest concentrations in surface water would be expected close to the streambed, while volatilization at the surface likely would lower concentrations in water near the stream surface.

The Department highly recommends that future stream samples be collected within several tenths of a foot of the streambed. The results of the currently deployed diffusion samplers may provide support for changing the sampling procedure. Appendix A needs to specify the depth-of-sample.

29. Engineering Inspection, Section 3.4, page 3-7, 2nd para:

What are the reasons for conducting engineering site inspections in both August and October? It would seem to DEP that these could be combined as one inspection in September, to coincide with the LTMP schedule for the Eastern Plume and Sites 1 & 3, which is April and September.

30. Landfill Gas Monitoring, Section 3.4.1, page 3-7, 2nd para:

"The objective of landfill gas monitoring at the Sites 1 and 3 landfills is to monitor and identify subsurface gas migration."

Many rounds of gas monitoring have occurred at Sites 1 and 3, and the data are presented in reports. In the 1998 Annual Report, the conclusions were that (1) there is limited methane production within the landfill, and (2) oxygen levels under the landfill cover are consistent at 21 percent, which is the atmospheric concentration. However, the report does not address the monitoring objective and interpret where and how subsurface gas is migrating. It appears that the microbial activity is low and not perceptibly changing, perhaps due to the relatively old age of the landfill. Based on the above observations, the Department questions if gas monitoring is worthwhile and an effective expenditure of funds.

31. Laboratory Quality Assurance and Quality Control, Section 3.5.2, page 3-8, last sentence:

"...and recommend how the data should be utilized".

The Department staff understands that this means that data that does not conform to the quality standards will be qualified as not suitable for certain types of interpretations, but the public may not understand this. We suggest the following revision:

"...and recommend which data are not of sufficient quality for use in quantitative interpretations (for example, risk assessments)."

32. Settlement and Subsidence Control Maintenance, Section 4.1.3, page 4-2, 2nd paragraph:

Just for clarification the Department suggests the following language: Following restoration of the hydraulic barrier grade, *the GCL and geomembrane will be repaired and tested per the construction specification and*, the overlying layers will be reconstructed.

33. Data Uses, Appendix B, Quality Assurance Project Plan, section 2.3, page 2-1:

Data uses in the QAPP should reflect goals listed in section 1.1 of the LTMP.

34. Project Reporting Limits, Appendix B, Quality Assurance Project Plan, Section 5.5, page 5-4, table:

Although the laboratory MDLs for Vinyl Chloride and Thallium are higher than state MEGs, the method is adequate for long term monitoring, at this time. This may become an issue when [if] a determination about the "cleanness" of the site is made.

35. Table 3-1, Appendix B, Quality Assurance Project Plan:

Table 3-1 in the QAPP only includes aqueous samples. Sediment samples should also be listed since they are being collected. There is an error in the formula for nitric acid. The formula should be HNO_3.

36. Tables 5-1 and 5-2, Appendix B, Quality Assurance Project Plan:

Tables 5-1 and 5-2 also only include aqueous samples. Sediment samples should be included as well.

37. Table 8-1, Appendix B, Quality Assurance Project Plan:

In the instrument maintenance section [table 8-1], the GC maintenance portion is missing,. Please provide.

38. Attachment A-1:

Holding time corrective action [Attachment A-1: Holding Time Laboratory Corrective Action] does not include flagging the report. Either reports should be flagged, or some other mechanism should be worked out to assure samples have been analyzed within the holding time.

39. Attachment A-1:

Laboratory control samples and matrix spikes for method 8260B [Attachment A-1 SW846 5030A/8260B] should be fortified with analytes of concern. Control limits should also be set for these analytes in the QC samples.

40. Attachment A-2:

Are the acceptance criteria in Attachment A-2 the same for sediment samples as it is for aqueous samples? If there is a difference for sediment samples these criteria should be included.

41. Response of Comments Received on the Draft LTMP, Appendix C, MEDEP Comment 9:

It would be helpful to know concentration relative to flow. Therefore it should be noted at the time of sampling whether the flow is high or low and this can be quantified by taking water depth.

Thank you for the opportunity to review this report. If you have any questions or comments please call me at (207) 287-7713.

Respectfully,

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